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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/590,627

08/24/2006

Katsuhiko Hayashi

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EXAMINER

NORRIS, JEREMY C

ART UNIT

PAPER NUMBER

2841

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,627	<b>Applicant(s)</b> HAYASHI, KATSUHIKO	
	<b>Examiner</b> Jeremy C. Norris	<b>Art Unit</b> 2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/07</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Priority*

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 4-10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2004/0246688 A1 (Pai) in view of US 6,078,097 Ohsawa).

Pai discloses, referring primarily to figures 1I & 1J, a multilayer wiring board comprising at least two wiring boards (164, 166), each of the wiring boards comprising an insulating substrate (102) and a wiring pattern (104) which comprises a conductive metal, at least one of the at least two wiring boards having the wiring patterns (104, 106) on both surfaces of the insulating substrate, at least part of the wiring patterns on

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the insulating substrate being connected via a conductive metal (108, 110) in a through hole through the insulating substrate, the wiring boards being electrically connected by joining of low-melting conductive metal layers (154) on connection terminals at the mating surfaces of the wiring boards, and the at least two wiring boards being bonded by means of an adhesive resin (160) that is selectively applied on the wiring boards other than on the connection terminals. Pai does not specifically disclose that the adhesive resin is polyimide [claim 1]. However, it is well known in the art to use polyimide as an adhesive resin as evidenced by Ohsawa (col. 4, lines 35-40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use polyimide as the adhesive in the invention of Pai as is known in the art and evidenced by Ohsawa. The motivation for doing so would have been to use a material with a low glass transition point temperature (Ohsawa col. 4, lines 35-40).

Regarding the limitations that the adhesive layer be applied “by screen printing”, and all of the process limitations associated with the insertion of the metal foil into the through hole [claims 4, 5] these imitations are process limitations and thus have been considered only to the extent to which said processes impact the structure of the device, since it has been held “even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Furthermore, the modified invention of Pai teaches, wherein the polyimide adhesive resin includes a heat-curable polyimide (Ohsawa, col. 4, lines 35-40) [claim 2], wherein the insulating substrate is an insulating resin film having flexibility (polyimide inherently has flexibility, Pai [0023]) [claims 6, 12], wherein the low-melting conductive metal layer is plated solder layer (Pai [0030]-[0031]) [claim 7], wherein a first conductive metal layer on an electrical connection surface of a wiring board, and a second conductive metal layer on an electrical connection surface of a mating wiring board electrically connected with the wiring board have at least one combination of plated solder layer/plated solder layer (Pai [0030]-[0031]) [claim 8], wherein the wiring patterns comprise a conductive metal containing copper (Pai [0024]) [claim 9], wherein the conductive metal inserted in the through hole through the insulating substrate contains copper (Pai, [0026]) [claim 10].

Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pai in view of Ohsawa as applied to claims 1 and 2 above, and further in view of US 6,342,455 B2 (Carter).

The modified invention of Pai teaches the claimed invention as described above with respect to claims 1 and 2 as described above except modified Pai does not specifically teach, wherein the polyimide adhesive gives a cured product having a dielectric constant of 3.1 to 3.7 [claims 3, 11]. However, it is well known to use polyimides having a dielectric constant in this range as evidenced by Carter (col. 1, lines 40-50). Therefore it would have been obvious to one having ordinary skill in the art at

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the time of invention to use a polyimide having a dielectric constant of 3.1—3.7 as is known in the art and evidenced by Carter. The motivation for doing so would have been to enable closer spacing of circuit lines without a concomitant increase in crosstalk and capacitive coupling (Carter col. 1, lines 35-55).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is (571)272-1932. The examiner can normally be reached on Monday - Thursday, 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean A. Reichard can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeremy C. Norris  
Primary Examiner  
Art Unit 2841

/Jeremy C. Norris/  
Primary Examiner, Art Unit 2841